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ABSTRACT

The Time for Mastery Program was specifically designed to minimize the time costs of mastery learning by maximizing the use of instructional time to the fullest advantage. The program was implemented by three high school districts in suburban Chicago during the 1984-85 academic year. This article presents a brief description of the program, as well as a report of the outcomes realized thus far, and a discussion of implications for the design of staff development programs. The program is delivered through a five-day summer seminar and three on-day follow-up sessions during the first semester of school. In addition to the summer seminar and the follow-up sessions, the teachers are also trained in peer observation and coaching. The focus of the program centers on the positive alteration of two variables: instructional time and testing practices. The content of the program reflects a combination of instructional practices drawn from the findings of the research on classroom management and mastery learning. It is noted that one of the key factors that can be attributed to the success of the program is the commitment of time for staff development. (JD)

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TIME FOR MASTERY

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Research and development efforts in mastery learning over the past decade have provided compelling evidence of the positive impact that the learning for mastery process has on student achievement (Block 1974, 1979; Block and Anderson 1975; Bloom 1968, 1976, 1981, 1984; Guskey 1980, 1981, 1984, 1985). Yet, despite this evidence and findings from the teacher effectiveness research (i.e. Rosenshine 1983, Lyskaowski and Walberg 1982) that emphasize the importance of the instructional principles of mastery learning, particularly the use of feedback and corrective strategies, recent studies show that these instructional strategies are infrequently employed in most classrooms. For example, the classroom observation data reported by Goodlad and his associates in the "Study of Schooling" (1983) indicate that less than 2 percent of instructional time in secondary classrooms is devoted to providing feedback to students on their progress and correction of their errors in learning.

One reason that might account for the fact that the instructional principles of mastery learning are rarely applied in high school instruction is that, especially at the secondary school level, the press to "cover" content often conflicts with the goal of assisting students to attain mastery of their learning. In most high school classrooms the resolution of this conflict results in content coverage taking precedence over content mastery. To run the risk of slowing down the pace or diminishing the scope of instruction by setting aside class time for feedback and corrective activities is considered to be too great a price to pay for implementing mastery learning.

The Time for Mastery Program, developed by the Center for Educational Policy and Management at the University of Oregon, was specifically designed to minimize the time costs of mastery learning by maximizing the use of instructional time to the fullest advantage. The program was implemented by

three high school districts in suburban Chicago communities during the 1984-85 academic year. In this article a brief description of the program will be presented, as well as a report of the outcomes of the program realized thus far, and a discussion of some of the program's implications for the design of staff development programs.

THE TIME FOR MASTERY PROGRAM

According to Bloom (1981), a major revolution in educational research has taken place over the past decade. He attributes the shift of researchers' attention from the study of static variables related to school learning to those variables that can be considered as alterable elements in the teaching/learning process as one of the prime factors in this revolution. Among the alterable variables Bloom has identified are two that are directly concerned with the dilemma high school teachers face in their efforts to accomplish the dual goals of content coverage and content mastery. The Time for Mastery Program has incorporated findings from the research on instruction that deal with both of these variables.

The first of these alterable variables is the amount of time students spend engaged in their learning, as opposed to the fixed amount of time allocated for instruction. Findings from the research on teacher effectiveness indicate that when teachers employ certain classroom management and organizational strategies, their students spend more time engaged in their learning (Anderson, Evertson, and Brophy 1978; Berliner, Fisher, Filby, and Marilave, 1978; Emmer and Evertson 1980, 1981; Fizpatrick 1982; Good and Grouws 1978; Stallings 1980). These findings suggest that teachers' managerial decisions can directly impact the proportion of time that is devoted to teaching and learning. Consequently, regardless of the amount of time allocated for instruction, the amount of learning time that occurs in classrooms can be positively altered.

The second alterable component of instruction Bloom has identified is the inclusion of formative testing and corrective procedures within the instructional design. The use of formative tests to provide students with feedback on their learning progress and to specify for them corrective procedures to follow for remediating their learning errors is perhaps the chief characteristic that distinguishes mastery learning instruction from conventional instruction. Rather than relying solely on summative tests that simply rank students according to how well they have learned the content and objectives of the course, under mastery learning instruction formative tests are administered, feedback is provided to the students, and on the basis of their performance on the formative tests some are directed to complete corrective learning activities. When this use of formative testing is incorporated in teachers' instructional plans, the gains in their students' learning are considerable. Recent analyses of the effects of mastery learning indicate that the mean achievement score of students receiving corrective feedback falls at the 83rd percentile on control group distributions (Lysakowski and Walberg 1982). Thus, expanding testing procedures to include not only summative tests but also formative tests accompanied with appropriate feedback and correctives, is an alteration of instructional practice that can make an important difference in improving students' mastery of their learning.

The focus of the Time for Mastery Program centers on the positive alteration of both of these variables, instructional time and testing practices. The program enables teachers to capitalize on the amount of time available for learning in two ways: first, by employing research-based classroom management and organizational strategies to increase the proportion of time that is actually used for instructional purposes, and secondly, by incorporating the instructional principles of mastery learning within this additional amount of time available for learning. In short, the content of

the Time for Mastery Program reflects a combination of instructional practices drawn from the findings of the research on classroom management and mastery learning.

The program includes four major sets of activities that are designed to provide direct support and assistance to teachers in their efforts to apply these instructional ideas in their classrooms. The first set of program activities is a five-day summer seminar. During the seminar teachers are introduced to classroom management and organizational strategies and the principles of mastery learning. A research-based rationale for these instructional strategies is presented. Evidence that links the classroom management strategies with student academic engagement rates, and that reports the effects of corrective feedback on student achievement is highlighted. In addition, sample lessons that incorporate these instructional design components are distributed to the teachers. The sample lessons are simply offered as examples of how the research-based principles can be applied. It is emphasized, however, that there is no one "correct" way to apply these instructional strategies, and that they are not to be followed as a formula or recipe for effective instruction.

During the summer seminar the teachers are divided into content area teams. Each team develops lesson plans for units of instruction they will be teaching in the fall. By working together in teams, the teachers not only complete some advance planning, but also have the opportunity to receive feedback on their plans from both the program director and their colleagues. Furthermore, through the team planning sessions the teachers can broaden their instructional repertoires by drawing from the strengths of the various teaching styles represented on the team.

The second major component of the program involves three one-day follow-up sessions, each scheduled approximately one month apart during the first semester following the summer seminar. The purpose of the these

sessions is to provide ongoing assistance to the teachers in their initial efforts to apply the recommended instructional strategies in their classrooms and to give them an opportunity to share both their difficulties and their successes with one another. As in the team planning sessions, this exchange of ideas can help to increase the number of options teachers can consider in the management of their classrooms and in their application of mastery learning principles.

In addition to the summer seminar and the follow-up sessions the teachers are also trained in peer observing and coaching. During the training it is emphasized that the purpose of the observations is to provide objective, non-judgmental feedback to each other. As observers and coaches, the teachers provide a mirror for each other by collecting descriptive observational data that reflects the extent to which their actual instructional practice matches their intended applications of the research-based instructional strategies. Moreover, by serving as observers they see alternative approaches to applying these instructional practices that can provide them with additional ideas for effective use of these strategies in their own classrooms.

Lastly, throughout all of the program's activities time is provided for collegial planning sessions, which give the teachers an opportunity to share their concerns about using the recommended instructional strategies. During these problem-solving sessions, the teachers consider alternative ways to deal with these issues, and trouble-shoot other areas of potential concern. In addition, the collegial planning sessions enable teachers to collaborate on future applications of the research-based instructional practices.

During the 1984-85 academic year twenty-one mathematics teachers from three high school districts participated in the Time for Mastery Program. Did the program help them to find time for mastery? Did their students'

level of learning improve? Did they consider the program to be helpful to them? The answers to these questions follow.

CAN TIME BE FOUND FOR MASTERY?

Prior to their participation in the Time for Mastery Program, one class of each of the teachers was observed for five consecutive days. The observation cycle was then repeated twice during the first semester of the following academic year. The classroom observation instrument that was utilized was designed to assess the amount of class time allocated to various instructional functions, as well as the amount of class time spent in transition between instructional activities and in nonacademic interaction. Observers coded the occurrence of these events at one-minute intervals throughout the instructional period. At five-minute intervals they recorded the number of students who were off-task.

Table 1 provides an illustration of the average distribution of time allocated to each of the instructidonal functions by the teachers over the five pre- and ten post-observation periods. These percentages reveal that the teachers rarely used feedback and corrective activities prior to the Time for Mastery Program. Following the program, however, the teachers allocated more than 20 percent of class time to this instructional component. Furthermore, the aggregated percentages in the table disguise the fact that all but three of the 21 teachers who participated in the program allocated at least 10 percent of their class time to feedback and corrective activities following the program. The classroom observation data also provided the opportunity to compare rates of student off-task behavior, which averaged 13.4 percent prior to the teachers' participation in the program and 6.0 percent following the program.

The distribution of class time across the other instructional functions before and after the Time for Mastery Program indicated several

differences, besides those related to feedback and corrective activities and the amount of non-instructional time. For example, the time allocated to independent seatwork decreased by almost one-half, suggesting that more time was spent in substantive academic interaction with the students, rather than simply monitoring their work. Also, instructional time spent reviewing and correcting homework was decreased by one-third. Instead of spending class time in an overall review of previous lessons and correcting homework exercises, the teachers focused the corrective learning activities on the specific concepts or skills students required assistance with, as identified through formative assessments of their progress. As a consequence, the teachers were able to tailor their lessons more appropriately to the learning needs of their students. The post-observational data also indicated that the teachers spent more time in presenting and developing new material and administering quizzes.

Lastly, it is important to note that the teachers reported they had covered the same amount of material in their classes at the end of the first semester after the program as they had in prior years. Hence, it appears that they did not alter the scope or the pace of instruction as they implemented the learning for mastery process within their instruction. In other words, they did not sacrifice content coverage in their effort to increase their students' content mastery.

TEACHERS' ASSESSMENTS OF THE TIME FOR MASTERY PROGRAM

In addition to the data collected by the classroom observers, the teachers also assessed the effectiveness of the Time for Mastery Program. Prior to each of the follow-up sessions, the teachers were asked to prepare a brief (1-2 pages) summary of their evaluation of the program. These summaries were then discussed and exchanged with their colleagues at the follow-up sessions. Two examples of their assessments of the impact of the

program are noted below.

Assessment of Student Learning Outcomes. Following the program's summer seminar the teachers at one of the schools decided to compare the achievement of students enrolled in their classes the previous year (1983-84) with the achievement of those students enrolled in similar courses in the current year (1984-85). They were particularly interested in analyzing the performance of students participating in the honors program. The teachers said that they believed that the learning for mastery process could benefit the "average" and the "slower" student, but they wondered if it would really make any difference for those students who typically perform at higher levels of achievement. Hence, they selected the Honors Intermediate and College Algebra course as the target of their comparison. The curricular materials utilized in the course were the same during both of the years included in the comparison. Also, there was no difference in the manner that students were assigned to the classes each year.

The measure the teachers employed to conduct the comparison of student achievement was a criterion-referenced test they had designed and administered at the end of the first quarter of each year. It was a cumulative test that included all of the material that had been presented during the quarter. The criteria for determining the grades on the test remained the same for both years.

In analyzing the distributions of test grades, they found that 56 percent of their students had earned an A or a B during the 1983-84 academic year, compared to 74 percent of the students during the 1984-85 school year. Likewise, whereas 17 percent of the students had received D or F grades on the test at the end of the first quarter in 1983, only 7 percent received similar grades in 1984.

Although this comparison of student test scores included only a few classes in one subject at one school, the evidence of the effectiveness of

mastery learning that these teachers obtained from their own classrooms delivered a message to them that was far more powerful than any meta-analysis could ever possibly convey.

Reflections on Professional Growth. At the final follow-up session, the teachers shared their perspectives on their involvement in the program and their intentions concerning future applications of the instructional ideas that had been presented. One of the teachers expressed his reflections on his own professional growth in the following statement:

> "I really feel that these teaching ideas are valuable. Even though I had started to use some of these concepts in my teaching before the program, I really feel I markedly improved my instruction and use of instructional time. I am much more valuable to my students now. I reach individuals more readily and with more ease, and I spend my time in instruction instead of babysitting. I did not dive into mastery learning wholeheartedly at first, but I am a much better teacher for my efforts. That is what counts. That is what is important. For myself, I feel success."

TIME FOR STAFF DEVELOPMENT

While the results of the Time for Mastery Program thus far are encouraging, nevertheless the fact cannot be overlooked that perhaps one of the key factors that can be attributed to the success of the program is the commitment of time for staff development. The program did not simply provide the teachers with access to research findings on classroom management strategies and the instructional principles of mastery learning. Rather, the schools involved in the program committed a considerable amount of time and support to assist the teachers in applying these instructional ideas in their classes. Time was provided for the program's summer seminar, the follow-up sessions, peer observations and coaching, and opportunities for collegial planning sessions. Had the leadership of these schools not been willing to extend support by investing this time in the program, it is doubtful that the kinds of outcomes reported here could have been achieved.

As noted earlier, the content of the Time for Mastery Program is

research-based. It is also important to note, however, that the design of the program's training activities reflects research-based staff development practices. The findings from this area of research have consistently indicated that one-shot approaches to staff development, where teachers receive little or no support, and are given neither follow-up assistance nor opportunities for collegial planning, result in low levels of implementation, both in quality and duration (Coladarci and Gage 1984; Fullan and Pomfret 1977; Gall 1982, 1984; Joyce and Showers 1980; Lieberman and Miller 1981; Little 1982; Loucks 1983; Sparks 1983). On the other hand, this research indicates that the provision of time for staff development is one of the most valuable resources that can strengthen the instructional improvement process. Our experiences with the Time for Mastery Program add further evidence that when time is invested in staff development, the benefits to the instructional program, such as enabling teachers to use time for mastery, more than offset the costs.

Considering that the quality of the lives our students will lead will increasingly be dependent upon their success as life-long learners, we cannot afford to postpone much longer the time they achieve mastery of their learning in our schools. The time for mastery is now. If we are willing to invest time for staff development, we can begin to realize that goal.

Table 1
Percentage of Class Time Allocated to Instructional Functions
In Pre- and Post-Observations
(Standardized Per Teacher)

Instructional Function	Observational Period Pre	Post
Feedback-Corrective	.1	21.0
Transition/Non-Academic Interaction	12.0	8.5
Review/Correcting Homework	42.9	28.1
Quiz	6.4	7.8
Development/Guided Practice	27.9	29.1
Independent Practice	10.7	5.5

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